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FEE TRANSMITTAL
For FY 2005

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 500.00

Complete if Known	
Application Number	09/400,974-Conf. #4024
Filing Date	September 22, 1999
First Named Inventor	Hiroya SATO
Examiner Name	L. N. Le
Art Unit	2685
Attorney Docket No.	0033-0619P

METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): ____

☐ Deposit Account Deposit Account Number: 02-2448 Deposit Account Name: Birch, Stewart, Kolasch & Birch, LLP

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
Application Type	Fee ($)	Small Entity Fee ($)	Fee ($)	Small Entity Fee ($)	Fee ($)	Small Entity Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims		Extra Claims		Fee ($)		Fee Paid ($)
48	- 48 =		x		=	

Indep. Claims		Extra Claims		Fee ($)		Fee Paid ($)
4	- 4 =		x		=	

Multiple Dependent Claims

Fee ($)	Fee Paid ($)

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets		Extra Sheets		Number of each additional 50 or fraction thereof		Fee ($)		Fee Paid ($)
	- 100 =		/50		(round up to a whole number) x		=	

4. OTHER FEE(S) **Fees Paid ($)**

Non-English Specification, $130 fee (no small entity discount)

Other (e.g., late filing surcharge): 1402 Filing a brief in support of an appeal 500.00

SUBMITTED BY					
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AF IFW

OIPE JUN 2 6 2006 IAP13 PATENT & TRADEMARK OFFICE

MS APPEAL BRIEF - PATENTS
Docket No.: 0033-0619P
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Hiroya SATO et al.

Application No.: 09/400,974

Confirmation No.: 4024

Filed: September 22, 1999

Art Unit: 2685

For: MILLIMETER BAND SIGNAL TRANSMITTING/RECEIVING SYSTEM HAVING FUNCTION OF TRANSMITTING/RECEIVING MILLIMETER BAND SIGNAL AND HOUSE PROVIDED WITH THE SAME

Examiner: L. N. Le

APPEAL BRIEF TRANSMITTAL FORM

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Transmitted herewith is an Appeal Brief on behalf of the Appellants in connection with the above-identified application.

☐ The enclosed document is being transmitted via the Certificate of Mailing provisions of 37 C.F.R. § 1.8.

A Notice of Appeal was filed on June 26, 2006.

☐ Applicant claims small entity status in accordance with 37 C.F.R. § 1.27.

The fee has been calculated as shown below:

☐ Extension of time fee pursuant to 37 C.F.R. §§ 1.17 and 1.136(a) - $.

☒ Fee for filing an Appeal Brief - $500.00 (large entity).

☒ Check(s) in the amount of $500 is attached.

☐ Please charge Deposit Account No. 02-2448 in the amount of $0. A triplicate copy of this sheet is attached.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Dated: June 26, 2006

Respectfully submitted,

By________________________

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Attachment(s)

RWD
CG/RWD/kpc

Docket No.: 0033-0619
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Hiroya SATO et al.

Before the Board of Appeals

Application No.: 09/400,974

Confirmation No.: 4024

Filed: September 22, 1999

Art Unit: 2685

For: MILLIMETER BAND SIGNAL TRANSMITTING/RECEIVING SYSTEM HAVING FUNCTION OF TRANSMITTING/RECEIVING MILLIMETER BAND SIGNAL AND HOUSE PROVIDED WITH THE SAME

Examiner: L.N. Le

APPEAL BRIEF

MS Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

As required under § 41.37(a), this brief is filed within two months after the Notice of Appeal filed in this case on April 26, 2006, and is in furtherance of said Notice of Appeal.

The fees required under § 41.20(b)(2), and any required petition for extension of time, if applicable, for filing this brief and fees related thereto, are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1206:

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Hiroya SATO et al.

Before the Board of Appeals

Application No.: 09/400,974

Confirmation No.: 4024

Filed: September 22, 1999

Art Unit: 2685

For: MILLIMETER BAND SIGNAL TRANSMITTING/RECEIVING SYSTEM HAVING FUNCTION OF TRANSMITTING/RECEIVING MILLIMETER BAND SIGNAL AND HOUSE PROVIDED WITH THE SAME

Examiner: L. N. Le

APPEAL BRIEF ON BEHALF OF APPELLANTS: Hiroya SATO et al.

MS Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I. REAL PARTY IN INTEREST

The real party in interest for this application is the Assignee, Sharp Kabushiki Kaisha, 22-22, Nagaike-cho, Abeno-ku, Osaka, Japan.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 1-48 are currently pending in this application. Claims 1, 11, 15, and 18 are independent claims. Claims 1-48 are rejected and the subject of the present appeal.

IV. STATUS OF AMENDMENTS

No further amendments have been presented after the outstanding Office Action of January 26, 2006. The Amendment previously presented November 14, 2005 had been entered.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Disclosed in the present application are embodiments of a millimeter band signal transmitting/receiving system. According to the FCC, the spectrum between 30 GHz and 300 GHz is referred to as the millimeter wave band because the wavelengths for these frequencies are about one to ten millimeters[1]. In contrast, conventional radiowave band antennas have been developed for indoor use that are capable of handling up to UHF band frequencies (300 MHz to 3 Ghz).

Because of the continued reliance on the Fortune reference (stated below) by the Examiner, Appellants provide the following background on millimeter band technology, particularly with respect to indoor communications systems.

---

[1] Federal Communications Commission Bulletin Number 70, "Millimeter Wave Propagation: Spectrum Management Implications," July 1997 (www.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet70/oet70a.pdf)

Millimeter band waves can be transmitted by an omnidirectional antenna or a directive antenna[2]. In the case of a directive antenna, it is preferred that side lobes be kept as low as possible to improve the directivity of the main beam[3], and to reduce channel distortion caused by multipath reception[2]. The preferred approach to transmission of millimeter band signal waves is by directly transmitting a millimeter band signal wave in a line of sight propagation path between the transmitting antenna and receiving antenna[2]. A problem with line of sight transmission of millimeter band signal waves is that if a path between a transmitter and receiver is obstructed by an object, propagation of a direct wave traveling along a propagation path between the transmitter and receiver may be interrupted as the millimeter-wave is absorbed by the object (present specification at page 1, lines 13-17). In addition, Appellants have found that a problem with using millimeter-wave transmission for indoor wireless LAN applications is that unsatisfactory communication results from multiple paths when two waves are simultaneously received (present specification at page 8, lines 18-22). In the case of video signal transmission, the reception of multiple waves over multiple paths leads to a ghosting effect (present specification at page 8, line 26). In other words, signal waves from propagation paths that have been delayed during transmission are received simultaneously with a signal wave from a direct line of sight propagation path. The problem of multipath effects due to delayed components has

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[2] Takeshi Manabe, et al., "Effects of Antenna Directivity and Polarization on Indoor Multipath Propagation Characteristics at 60 GHz," IEEE J. Selected Areas in Communications, Vol. 14, No. 3, April 1996.
[3] Dr. Steven R. Best, "Antenna Properties and their impact on Wireless System Performance," Cushcraft Corp. 1998.

been show to be significantly greater with omnidirectional receiving antennas[2]. This problem is referred to as a multipath effect[2], or in the present application – affect from multiple paths.

A known approach to insure that an unobstructed millimeter band signal wave is received at a receiving antenna has been to automatically switch to an alternative radio wave path (present specification at paragraph bridging pages 1-2; "Manabe"). Through a combination of conventional reduction in side lobes and transmission over one propagation path at a time, the known approach effectively avoids multipath effects from more than one principal propagation path.

The present invention represents alternative and unintuitive solutions to the approach taken by Manabe for problems that occur in millimeter band signal transmitting/receiving systems, including blockage, shadowing, and multipath effects.

Claim 1

Embodiments of claim 1 are directed to a millimeter band signal transmitting/receiving system (e.g., millimeter band signal transmitting/receiving system shown in Figures 1-4), comprising:

a stationary transmitter transmitting a millimeter band signal wave (e.g., transmitter 1 for transmitting a millimeter wave video signal and antenna 31);

a propagation path forming portion forming at least one indirect propagation path (e.g., reflected wave 5) for propagation of said millimeter band signal wave; and

a stationary receiver (e.g., receiver 2 and antenna 32) including a receive antenna having a main lobe and a side lobe receiving said millimeter band signal wave simultaneously from a plurality of propagation paths including a line of sight propagation path (e.g., direct wave 4) to said transmitter and said at least one indirect propagation path (e.g., reflected wave 5), and receiving said millimeter band signal wave from at least one of said plurality of propagation paths (present specification at page 9, lines 5-15; see also, Fig. 2).

Claim 11

The claimed invention of claim 11, in preferred embodiments, is directed to a millimeter band signal transmitting/receiving system (e.g., millimeter band signal transmitting/receiving system shown in Fig. 5), comprising:

a plurality of stationary transmitters (e.g., transmitters 10 and 11, and associated antennas 31A and 31B); and

a stationary receiver including a receive antenna (e.g., receiver 20 and antenna 32) having a main lobe and a side lobe arranged to simultaneously receive a plurality of millimeter band signal waves output from said plurality of transmitters (e.g., present specification at page 13, lines 2-4),

said plurality of millimeter band signal waves being transmitted from said plurality of transmitters having a same frequency (present specification at page 13, lines 6-7).

Claims 12, 13

Claim 12 is directed to a millimeter band signal transmitting/receiving system of claim 11, wherein each of a plurality of transmitters includes a local oscillator oscillating at a

prescribed local oscillation frequency for generating the signal wave at the same frequency (an example of the claimed arrangement is shown in Figure 5, present specification at page 13, line 5).

Claim 13 is directed to the millimeter band signal transmitting/receiving system of claim 12, wherein the local oscillators are in synchronization with each other (present specification at page 14, lines 8-15).

Claim 15

Embodiments related to claim 15 are directed to a house (e.g., Figs. 1-4) provided with a millimeter band signal transmitting/receiving system including a structural component defining an internal space (e.g., ceiling 3) and a millimeter band signal transmitting/receiving system (e.g., millimeter band signal transmitting/receiving system shown in Figures 1-4). Similar to claim 1, the millimeter band signal transmitting/receiving system includes a stationary transmitter transmitting a millimeter band signal wave e.g., transmitter 1 and antenna 31), a propagation path forming portion arranged in the structural component for forming at least one indirect propagation path (e.g., reflected wave 5) for propagation of the millimeter band signal wave, and a stationary receiver (e.g., receiver 2 and antenna 32) including a receive antenna having a main lobe and a side lobe receiving the millimeter band signal wave simultaneously through a plurality of propagation paths including a line of sight propagation path (e.g., direct wave 4) to the transmitter and the at least one indirect propagation path (present specification at page 9, lines 5-15; see also, Fig. 1).

Claim 18

Preferred embodiments related to claim 18 are directed to a millimeter band signal transmitting/receiving system (e.g., millimeter band signal transmitting/receiving system shown in Figures 1-6), comprising:

at least one stationary transmitter (e.g., transmitter 1, or transmitters 10 and 11) transmitting a millimeter band signal through an associated transmit antenna (e.g., antenna 31, or antennas 31A and 31B) along a plurality of propagation paths (direct wave 4 and reflected wave 5, D wave, or E wave) of said millimeter band signal formed by said associated transmit antenna including a line of sight propagation path between said associated transmit antenna and a receive antenna (e.g., direct wave 4, D wave, or E wave);

a stationary receiver (e.g., receiver 2 or receiver 20) receiving the millimeter band signal through said receive antenna having a main lobe and a side lobe (e.g., disclosed in the present specification at page 9, lines 5-8),

wherein, in a normal state when said line of sight propagation path is unobstructed, said receiver receives the millimeter band signal through each of the plurality of propagation paths including said line of sight propagation path (present specification at page 8, lines 11-13), and

wherein, in an obstructed state when said line of sight propagation path is obstructed, said receiver receives the millimeter band signal through each of the plurality of propagation paths except said line of sight propagation path (e.g., see Fig. 2, present specification at page 8, lines 29-30).

Claims 24, 25, 26

Claim 24 is directed to a millimeter band signal transmitting/receiving system of claim 18, wherein the at least one transmitter includes two transmitters and two associated transmit antennas, wherein each of said two associated transmit antennas provides a separate line of sight propagation path to the receive antenna. (e.g., Fig. 5).

Claim 25 is directed to a millimeter band signal transmitting/receiving system of claims 18 and 24, wherein each of a plurality of transmitters includes a local oscillator oscillating at a prescribed local oscillation frequency for generating the signal wave at the same frequency (an example of the claimed arrangement is shown in Figure 5, present specification at page 13, line 5).

Claim 26 is directed to the millimeter band signal transmitting/receiving system of claim 25, wherein the local oscillators are in synchronization with each other (present specification at page 14, lines 8-15).

Claim 27

Claim 27 is directed to a millimeter band signal transmitting/receiving system as recited in claim 18 wherein the signal is a video signal (mentioned throughout the present specification, e.g., "Field of the Invention").

Claims 38, 39 and 40

The claimed invention of claim 38, in a preferred embodiment, is directed to the millimeter band signal transmitting/receiving system of claim 1, wherein said at least one

indirect propagation path is formed in a main lobe of a transmit antenna (present specification at page 9, lines 5-8).

The claimed invention of claim 39, in a preferred embodiment, is directed to the millimeter band signal transmitting/receiving system of claim 1, wherein said line of sight propagation path is formed in a side lobe of a transmit antenna (present specification at page 9, lines 5-8).

The claimed invention of claim 40, in a preferred embodiment, is directed to the millimeter band signal transmitting/receiving system of claim 15, wherein said line of sight propagation path is formed in a side lobe of a transmit antenna (present specification at page 9, lines 5-8).

Claim 41

The invention of claim 41 is directed to the millimeter band signal transmitting/receiving system according to claim 1, wherein the intensity of the signal wave received from the indirect propagation path is substantially the same as the intensity of the signal wave received from the line of sight propagation path (present specification at page 9, lines 7-10).

Claim 42

The invention of claim 42 is directed to the millimeter band signal transmitting/receiving system according to claim 41, wherein the intensity of the signal wave received from the indirect propagation path is at least 3dB greater than the intensity of the signal wave received from the line of sight propagation path (present specification at page 9, lines 7-10).

Claim 43

The invention of claim 43 is directed to the millimeter band signal transmitting/receiving system according to claim 1, wherein said stationary receiver receives a millimeter band signal wave having a carrier to noise ratio of at least 8dB when said line of sight propagation path signal wave is interrupted (present specification at page 16, lines 12-26).

Claim 44

The invention of claim 44 is directed to the millimeter band signal transmitting/receiving system according to claim 15, wherein the intensity of the signal wave received from the at least one indirect propagation path is substantially the same as the intensity of the signal wave received from the line of sight propagation path (present specification at page 9, lines 7-10).

Claim 45

The invention of claim 45 is directed to the millimeter band signal transmitting/receiving system according to claim 44, wherein the intensity of the signal wave received from the at least one indirect propagation path is at least 3dB greater than the intensity of the signal wave received from the line of sight propagation path (present specification at page 9, lines 7-10).

Claim 46

The invention of claim 46 is directed to the millimeter band signal transmitting/receiving system according to claim 15, wherein said stationary receiver receives a millimeter band signal

wave having a carrier to noise ratio of at least 8dB when said line of sight propagation path signal wave is interrupted (present specification at page 16, lines 12-26).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The outstanding Office Action provides four (4) grounds of rejection for review on appeal:

1. claims 1-11, 14-23, 28-40 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,450,615 to Fortune et al. (hereafter *Fortune*) in view of U.S. Patent No. 5,654,715 to Hayashikura et al. (hereafter *Hayashikura*) and U.S. Patent No. 6,643,526 to Katz (hereafter *Katz*);
2. claims 12, 13, and 24-26 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Fortune* in view of *Hayashikura* and *Katz*, and further in view of U.S. Patent No. 5,479,443 to Kagami et al. (hereafter *Kagami*);
3. claim 27 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Fortune* in view of *Hayashikura* and *Katz*, and further in view of U.S. Patent No. 5,920,813 to Evans et al. (hereafter *Evans*); and
4. claims 41-48 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Fortune* in view of *Hayashikura* and *Katz*, and further in view of U.S. Patent No. 6,249,321 to Bae et al. (hereafter *Bae*).

VII. ARGUMENTS

A. The Examiner's Rejection over Fortune, Hayashikura, and Katz Fails to Establish *Prima Facie* Obviousness of Independent Claim 1

1. Argument Summary

The Examiner's reasoning provided in support of the rejection of claim 1 under 35 U.S.C. §103(a) as being obvious under *Fortune, Hayashikura, and Katz* fails to establish *prima facie* obviousness. Specifically, the deficiencies of the rejection are that the rejection fails to establish proper motivation to combine the references, and even if the references could be combined they would still not teach or suggest each and every claimed feature. These deficiencies exist for the rejection of each of claims 1-10, 33, 34, 38, and 39.

2. Legal Requirements of *Prima Facie* Obviousness

To establish *prima facie* obviousness, all claim limitations must be taught or suggested by the prior art and the asserted modification or combination of the prior art must be supported by some teaching, suggestion, or motivation in the applied references or in knowledge generally available to one skilled in the art. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). The prior art must suggest the desirability of the modification in order to establish a *prima facie* case of obviousness. *In re Brouwer*, 77 F.3d 422, 425, 37 USPQ2d 1663, 1666 (Fed. Cir. 1995). It can also be said that the prior art must collectively suggest or point to the claimed invention to support a finding of obviousness. *In re Hedges*, 783 F.2d 1038, 1041, 228 USPQ 685, 687 (Fed. Cir. 1986); *In re Ehrreich*, 590 F.2d 902, 908-909, 200 USPQ 504, 510 (C.C.P.A. 1979).

The teaching or suggestion to make the asserted combination or modification of the primary reference must be found in the prior art and cannot be gleaned from applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). In other words, the use

of hindsight to reconstruct the claimed invention is impermissible. *Uniroyal Inc. v. Rudlan-Wiley Corp.*, 5 USPQ 1434 (Fed. Cir. 1983).

Finally, when considering the differences between the primary reference and the claimed invention, the question for assessing obviousness is not whether the differences themselves would have been obvious, but instead whether the claimed invention as a whole would have been obvious. *Stratoflex Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983).

3. The Rejection Fails to Establish *Prima Facie* Obviousness of Independent Claim 1

Embodiments of claim 1 are directed to a millimeter band signal transmitting/receiving system (e.g., millimeter band signal transmitting/receiving system shown in Figures 1-4), comprising:

a stationary transmitter transmitting a millimeter band signal wave (e.g., transmitter 1 for transmitting a millimeter wave video signal);

a propagation path forming portion forming at least one indirect propagation path (e.g., reflected wave 5) for propagation of said millimeter band signal wave; and

a stationary receiver (e.g., receiver 2) including a receive antenna having a main lobe and a side lobe (antenna 32; page 9, lines 4-7) receiving said millimeter band signal wave simultaneously from a plurality of propagation paths including a line of sight propagation path (e.g., direct wave 4) to said transmitter and said at least one indirect propagation path (e.g., reflected wave 5), and receiving said millimeter band signal wave from at least one of said plurality of propagation paths (present specification at page 9, lines 5-15; see also, Fig. 2).

In maintaining the rejection of claim 1, the Examiner alleges in the Office Action mailed January 26, 2006, on pages 2-4, the following:

> In regards to claim 1, *Fortune* discloses at fig. 2 the following:
>
> a) a stationary transmitter positioned at 210 transmitting a signal wave (fig. 2);
>
> b) a propagation path forming portion forming at least one indirect propagation path 219 from 210 towards floor 216 and to the receiver 212 for propagation of the RF band signal wave;
>
> c) a stationary receiver at 212 including a receive antenna 215 receiving the signal wave a plurality of the signal waves from a plurality of propagation paths including a line of sight propagation path 217 and the at least one indirect propagation path 219, and receiving the signal wave from at least one of the plurality of propagation paths (col. 5, line 43 – col. 6, line 67), and that different types of antennas can be used to calculate propagation path loss (col. 6, lines 52-56); and different types of antennas can be used to calculate path losses (col. 6, lines 52-56).
>
> In regards to claim 1, *Fortune* fails to disclose the following:
>
> d) a millimeter band signal transmitting/receiving system, and a millimeter band propagation signal, transmitting and receiving a millimeter band signal wave and the receive antenna having a main lobe and a side lobe.
>
> In regards to claim 1, *Hayashikura* discloses the following:
>
> e) a millimeter band signal transmitting/receiving system, and a millimeter band propagation signal transmitting and receiving a millimeter band signal wave (col. 2, lines 7-18; col. 3, lines 60-67).
>
> As a motivation to combine *Fortune* and *Hayashikura* the rejection states:
>
> f) "It would have been obvious to one of ordinary skill in the art at the time the invention was made to comprise the indoor, in-building high frequency band signal of Fortune et al with the millimeter band signal in order to fully utilize the continuous spectrum by broadening the intended use of the signal wave for commercial purposes merely by using an alternative frequency in a higher frequency band than usual depending on the available spectrum resource of the system."

Appellants respectfully disagree that *Fortune* and *Hayashikura* suggests the desirability of the claimed invention (**M.P.E.P.** § 2143.01).

a. One of ordinary skill in the art would not have been motivated to combine *Fortune* and *Hayashikura* in a manner of the claimed invention.

To establish obviousness based on a combination of elements disclosed in the prior art, there must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant. The motivation suggestion or teaching may come explicitly from the statements in the prior art, the knowledge of one of ordinary skill in the art, or in some cases, the nature of the problem to be solved. See *In re Dembiczak*, 50 USPQ2d 1614 (Fed.Cir. 1999). The CAFC has held that even though various elements of the claimed invention were present (in two separate embodiments of the same prior art reference), there was no motivation to combine the elements from the separate embodiments, based on the teachings in the prior art. See *In re Kotzab*, 55 USPQ2d 1313 (Fed.Cir. 2000).

In order to establish a *prima facie* case of obviousness under 35 U.S.C. §103(a), the Examiner must provide particular findings as to why the two pieces of prior art are combinable. See Dembiczak 50 USPQ2d at 1617. Broad conclusory statements standing alone are not "evidence".

The statement of motivation provided in the rejection for the combination of *Fortune* and *Hayashikura* states that it would have been obvious to one of ordinary skill in the art "to comprise the indoor, in-building high frequency band signal of Fortune et al with the millimeter band signal in order to fully utilize the continuous spectrum ...". To the contrary, *Hayashikura* is directed to a plurality of radar devices provided on and along the periphery of a vehicle for monitoring in different directions. *Hayashikura* provides no teaching of applying its millimeter

band signal to indoor, in-building wireless indoor communication systems. *Fortune* provides no teaching of applying its technique for predicting the indoor coverage area of wireless transmission systems using ray tracing approaches to a radar system.

Furthermore, Appellants submit that there is no teaching in Fortune of modifying *Hayashikura's* radar devices into alternative arrangements provided in *Fortune's* disclosed prediction technique for indoor wireless communication systems. In particular, Appellants submit that modifying *Hayashikura's* radar to include a line of sight propagation path between the transmitter and receiver would render its radar unsatisfactory for its intended purpose. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

No particular findings as to why the two pieces of prior art are combinable have been provided to suggest that it is knowledge of persons of ordinary skill in the art that *Fortune's* indoor, in-building high frequency band signal would be modified with the millimeter band signal.

Instead, Appellants submit that the rational of "in order to fully utilize the continuous spectrum by broadening the intended use of the signal wave for commercial purposes merely by using an alternative frequency in a higher frequency band than usual depending on the available spectrum resource of the system" is a broad conclusory statement, not "evidence."

Thus, Appellants submit that the rejection has failed to establish a teaching, suggestion, or motivation to combine *Fortune* and *Hayashikura*.

Appellants respectfully disagree that *Fortune, Hayashikura,* and *Katz* suggests the desirability of the claimed invention (**M.P.E.P.** § 2143.01).

b. One of ordinary skill in the art would not have been motivated to combine *Fortune, Hayashikura,* and *Katz* in a manner of the claimed invention.

The rejection admits that *Fortune* and *Hayashikura* do not explicitly teach a main lobe and a side lobe in an antenna for receiving the millimeter wave simultaneously. The rejection further states that, "it is notoriously well known in the art that a main lobe and a side lobe is part of a conventional directional antenna as taught by Katz." Appellants agree that a main lobe and a side lobe may be formed in a directional antenna. However, the invention according to claim 1 is an arrangement between a transmitter transmitting a millimeter band signal and a receiver receiving the millimeter band signal simultaneously from a plurality of propagation paths including a line of sight propagation path to the transmitter and at least one indirect propagation path.

Regarding the combination of *Fortune*, *Hayashikura* and *Katz*, the rejection states that, "it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a main lobe and a side lobe in order to simultaneously receive multipath millimeter signals of the modified system of Fortune et al and Hayashikura et al from other lobes other than the one main lobe simultaneously since a signal is unlikely to come from just a single beam direction due to multipath effect as suggested by Katz (col. 8, lines 28-41)."

Katz is directed to an apparatus for directional radio communications, for example for a cellular communication network using space division multiple access (SDMA). SDMA is presented as a way of reducing the number of required base stations while increasing the size of each cell (Katz at col. 1, lines 38-56). SDMA allows two or more mobile stations to communicate at the same frequency from different locations within the same cell, leading to an

increase in the amount of traffic which can be carried by the cellular network (Katz at col. 1, line 57, to col. 2, line 4).

Katz discloses that a problem with SDMA is that the direction in which signals should be transmitted to a mobile station needs to be determined (Katz at col. 2, lines 15-17). *Katz* discloses a solution using directional radio communication between a first station and a second station where the first station transmits signals in a number of beam directions at different phases. *Katz* discloses a base station that acts as a transceiver including an antenna array of preferably eight antenna elements (Katz at col. 7, lines 11-24).

Katz indicates that, "in practice, a signal is unlikely to be received from just a single beam direction due to side lobes and/or multipath effects." *Katz* goes on to state that, "the level or amplitude of the signal received in a number of beam directions will often be quite low and as such, in some embodiments of the present invention be disregarded." The butler matrix of *Katz* is disclosed as receiving on the antenna elements eight versions of the same signal which are phase shifted with respect to one another. (Katz at col. 8, lines 28-36).

Thus, Appellants submit that *Katz* does not teach an antenna having "a main lobe and a side lobe in order to simultaneously receive multipath millimeter signals ... from other lobes other than the main beam lobe simultaneously." Furthermore, Appellants agree that *Katz* teaches that a signal is unlikely to be received from just a single beam direction due to multipath effect. However, the rational that "a signal is unlikely to come from just a single beam direction due to multipath effect as suggested by *Katz*" may be true, but does not provide a motivation to combine *Katz* with *Fortune* and *Hayashikura*. Therefore, Appellants maintain that insufficient

evidence has been provided of a teaching, suggestion or motivation to combine the teachings of *Fortune*, *Hayashikura*, and *Katz*.

As such, Appellants maintain that independent claim 1 is patentable over *Fortune, Hayashikura* and *Katz*.

c. The Rejection of Independent Claim 1 fails to teach each and every claimed element

For at least the reasons presented herein, Appellants maintain that the rejection has failed to establish a *prima facie* case of obviousness because the rejection has failed to provide references that teach or suggest each and every feature as set forth in the claimed invention. Thus, Appellants maintain that independent claim 1 is allowable over *Fortune, Hayashikura* and *Katz*.

"It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *In re Wesslau*, 147 USPQ 391, 393 (CCPA 1965).

The rejection appears to piece together features from unrelated context and allege that they teach sub-features within the claim. For example, the rejection relies on two references for teaching the claimed "stationary transmitter" and three references for teaching the claimed "stationary receiver."

In particular, the rejection alleges that *Fortune* teaches the claimed "stationary transmitter" positioned at 210, but relies on *Hayashikura* for teaching the function of the

transmitter of "transmitting a millimeter band signal wave." The claim, however, is limited to the single element of "a stationary transmitter transmitting a millimeter band signal wave." Appellants submit that *Fortune* fails to teach or suggest a transmitter transmitting a millimeter band signal, as claimed.

Of the cited references, *Fortune* and *Hayashikura*, only *Hayashikura* shows a transmitting antenna 14 supplied with a millimeter-band carrier wave signal that is radiated as an electromagnetic wave (*Hayashikura* at col. 3, lines 64-67). In particular, *Hayashikura* appears to teach a plurality of paired transmitter and receiver sections provided on and along a periphery of a vehicle, each transmitter sections transmitting an electromagnetic wave, each of the receiver sections receiving a reflected wave from an object (*Hayashikura* at col. 2, lines 9-13). However, *Hayashikura* is directed to a radar where the transmitter transmits only a reflected beam to a respective receiver. Claim 1 requires transmitting of a millimeter band signal wave over a line of sight propagation path, as well as at least one indirect propagation path.

In the case of the single claimed element of a "stationary receiver," the rejection relies on three references. The rejection appears to rely on *Fortune* for teaching a stationary receiver including a receive antenna. The rejection appears to rely on *Hayashikura* for teaching the claimed "receiving a millimeter band signal wave." The rejection appears to rely on *Katz* for teaching a directional antenna having a main lobe and a side lobe.

Appellants submit that *Fortune* does not teach or suggest the "stationary receiver," as claimed. In particular, Appellants submit that *Fortune* fails to teach or suggest a stationary receiver including a receive antenna capable of receiving a millimeter band signal wave.

Hayashikura is directed to radar devices provided along the periphery of a vehicle. *Katz* is directed to an apparatus for directional radio communication in a cellular communication network. *Katz* discloses a phase array antenna 6 having, in an example embodiment, eight antenna elements. *Katz* does appear to mention "side lobes" in the context of explaining an assumption that side lobes would be quite low and can be disregarded (*Katz* at col. 8, lines 28-33).

Thus, of the three references, only *Hayashikura* teaches a millimeter band signal transmitting/receiving system having a transmitter transmitting a millimeter band signal wave and a receiver receiving the millimeter band signal wave. *Fortune* and *Katz* do not appear to disclose a transmitter and receiver that transmit millimeter band signal waves. However, *Hayashikura* does not teach or suggest an arrangement where the receiver receives a millimeter band signal wave simultaneously from a plurality of propagation paths including a line of sight propagation path to the transmitter. In particular, because *Hayashikura* is directed to a radar mounted on a vehicle, an arrangement having a line of sight propagation path between a transmitter and a receiver would render the radar of *Hayashikura* unsatisfactory for its intended purpose. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Therefore, Appellants submit that the rejection fails to establish *prima facie* obviousness since *Fortune*, *Hayashikura*, and *Katz* fail to teach at least the claimed "stationary receiver including a receive antenna having a main lobe and a side lobe receiving said millimeter band signal wave simultaneously from a plurality of propagation paths including a line of sight propagation path to said transmitter and said at least one indirect propagation path."

At least for these reasons, Appellants maintain that independent claim 1 is allowable over *Fortune, Hayashikura* and *Katz.*

d. Even if it could be said that there would be proper motivation to combine Fortune, Hayashikura, and Katz, the combination would still not teach or suggest the claimed invention of Claim 1

Appellants submit that *Fortune*, *Hayashikura*, and *Katz* would not lead one of ordinary skill in the art to an arrangement that would be different from that of the conventional solution disclosed in Manabe (present specification at section "Description of the Background Art").

As discussed above in the "Summary of the Claimed Subject Matter", Manabe teaches a solution to the problem of obstruction of millimeter band signal waves of selecting between alternative radio wave paths, choosing one line of sight path at a time. As pointed out by Appellants, when more than one propagation path is simultaneously received by a receiver (e.g., via a direct propagation path and a delayed indirect propagation path for a previously transmitted signal wave), a problem of unsatisfactory effects from multiple paths occurs (specification at page 8). Thus, conventional direct transmission of millimeter band signal waves is done by reducing side lobes as much as possible. There is no teaching in *Fortune, Hayashikura* or *Katz* that would lead one of ordinary skill in the art to anything but a conventional arrangement of directive antennas for line of sight transmission of a single millimeter band signal wave at a time with reduced side lobes.

Fortune specifically discloses a preferred assumption of a vertical half-wave dipole antenna (Fortune at col. 5, lines 18-20; i.e., an omnidirectional RF antenna). Fortune is directed to prediction of propagation paths for an indoor wireless communications system having mobile

devices. An omnidirectional RF antenna enables the mobile devices to be movable to various locations without having to change radiation direction of the antenna. For other types of antenna, *Fortune's* technique makes a simplifying assumption that path losses can be scaled by multiplying a total calculated path loss by the antenna power gain in the direction of interest (*Fortune* at col. 52-56). Appellants submit that even if a possibility of a different type of antenna were taken into consideration (e.g., directive antenna), there is still no teaching or suggestion that anything but the conventional arrangement of directive antennas for transmission of a single line of sight propagation path at a time, with minimum side lobes, would be used.

Hayashikura is directed to a radar system having a single reflected propagation path. *Katz* indicates that signals received due to side lobes are often quite low and can be disregarded (*Katz* at col. 8, lines 28-33). Thus, the teachings of *Katz* or *Hayashikura* would not lead one of ordinary skill to a solution that would be anything but the solution suggested in Manabe of a single line of sight propagation path at a time with reduced side lobes.

Thus, at least for these additional reasons Appellants maintain that independent claim 1 is allowable over *Fortune, Hayashikura* and *Katz*.

B. The Examiner's Rejection over Fortune, Hayashikura, and Katz Fails to Establish *Prima Facie* Obviousness of Independent Claim 11

1. Argument Summary

The Examiner's reasoning provided in support of the rejection of claim 11 under 35 U.S.C. §103(a) as being obvious under *Fortune, Hayashikura, and Katz* fails to establish *prima facie* obviousness. Specifically, the deficiencies of the rejection are that the rejection fails to establish proper motivation to combine the references, and even if the references could be combined they would still not teach or suggest each and every claimed feature. These deficiencies exist for the rejection of each of claims 11, 14, and 35.

2. Legal Requirements of *Prima Facie* Obviousness

To establish *prima facie* obviousness, all claim limitations must be taught or suggested by the prior art and the asserted modification or combination of the prior art must be supported by some teaching, suggestion, or motivation in the applied references or in knowledge generally available to one skilled in the art. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). The prior art must suggest the desirability of the modification in order to establish a *prima facie* case of obviousness. *In re Brouwer*, 77 F.3d 422, 425, 37 USPQ2d 1663, 1666 (Fed. Cir. 1995). It can also be said that the prior art must collectively suggest or point to the claimed invention to support a finding of obviousness. *In re Hedges*, 783 F.2d 1038, 1041, 228 USPQ 685, 687 (Fed. Cir. 1986); *In re Ehrreich*, 590 F.2d 902, 908-909, 200 USPQ 504, 510 (C.C.P.A. 1979).

The teaching or suggestion to make the asserted combination or modification of the primary reference must be found in the prior art and cannot be gleaned from applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). In other words, the use of hindsight to reconstruct the claimed invention is impermissible. *Uniroyal Inc. v. Rudlan-Wiley Corp.*, 5 USPQ 1434 (Fed. Cir. 1983).

Finally, when considering the differences between the primary reference and the claimed invention, the question for assessing obviousness is not whether the differences themselves would have been obvious, but instead whether the claimed invention as a whole would have been obvious. *Stratoflex Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983).

3. The Rejection Fails to Establish *Prima Facie* Obviousness of Independent Claim 11

The claimed invention of claim 11, in preferred embodiments, is directed to a millimeter band signal transmitting/receiving system (e.g., millimeter band signal transmitting/receiving system shown in Fig. 5), comprising:

a plurality of stationary transmitters (e.g., transmitters 10 and 11, and associated antennas 31A and 31B); and

a stationary receiver including a receive antenna (e.g., receiver 20 and antenna 32) having a main lobe and a side lobe arranged to simultaneously receive a plurality of millimeter band signal waves output from said plurality of transmitters (e.g., present specification at page 13, lines 2-4),

said plurality of millimeter band signal waves being transmitted from said plurality of transmitters having a same frequency (present specification at page 13, lines 6-7).

In maintaining the rejection of claim 11, the Examiner alleges in the Office Action mailed January 26, 2006, on pages 6-7, the following:

> In regards to claim 11, *Fortune* discloses the following:
>
> a) a plurality of stationary transmitters (col. 6, lines 63-67) which is set up at the transmitter point 210;
>
> b) a stationary receiver at 212 including a receive antenna 215 arranged to receive a plurality of signal waves output from the plurality of transmitters, the plurality of transmitters having a same frequency due to the same path length from the transmitter point 210 (col. 6, lines 63-67; col. 5, lines 45-53), and that different types of antennas can be used to calculate propagation path loss (col. 6, lines 52-56); and different types of antennas can be used to calculate propagation path loss (col. 6, lines 52-56).
>
> In regards to claim 11, *Fortune* fails to disclose the following:
>
> c) a millimeter band signal transmitting/receiving system transmitting and receiving a plurality of millimeter band signal waves, and the receive antenna having a main lobe and a side lobe for receiving the millimeter wave simultaneously.
>
> In regards to claim 11, *Hayashikura* discloses the following:

d) a millimeter band signal transmitting/receiving system, and a millimeter band propagation signal transmitting and receiving a millimeter band signal wave (col. 2, lines 7-18; col. 3, lines 60-67).

As a motivation to combine *Fortune* and *Hayashikura* the rejection states:

e) "It would have been obvious to one of ordinary skill in the art at the time the invention was made to include in the indoor, in-building high frequency band signal of Fortune et al with the millimeter band of Hayashikura et al in order to obtain microwave and above frequencies in the same continuous wireless radio frequency for more practical applications, i.e. local multipoint distribution services in the indoor environment of Fortune et al, which serves as intended commercial use purpose."

Appellant respectfully disagrees that *Fortune* and *Hayashikura* suggests the desirability of the claimed invention (**M.P.E.P.** § 2143.01).

a. One of ordinary skill in the art would not have been motivated to combine *Fortune* and *Hayashikura* in a manner of the claimed invention.

To establish obviousness based on a combination of elements disclosed in the prior art, there must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant. The motivation suggestion or teaching may come explicitly from the statements in the prior art, the knowledge of one of ordinary skill in the art, or in some cases, the nature of the problem to be solved. See *In re Dembiczak*, 50 USPQ2d 1614 (Fed.Cir. 1999). The CAFC has held that even though various elements of the claimed invention were present (in two separate embodiments of the same prior art reference), there was no motivation to combine the elements from the separate embodiments, based on the teachings in the prior art. See *In re Kotzab*, 55 USPQ2d 1313 (Fed.Cir. 2000).

In order to establish a *prima facie* case of obviousness under 35 U.S.C. §103(a), the Examiner must provide particular findings as to why the two pieces of prior art are combinable.

See Dembiczak 50 USPQ2d at 1617. Broad conclusory statements standing alone are not "evidence".

The statement in the rejection of a motivation to combine *Fortune* and *Hayashikura* states that it would have been obvious to one of ordinary skill in the art "to include in the indoor high frequency band of Fortune et al the millimeter band of Hayashikura et al in order to obtain microwave and above frequencies in the same continuous wireless radio frequency spectrum …". To the contrary, *Hayashikura* is directed to a plurality of radar devices provided on and along the periphery of a vehicle for monitoring in different directions. *Hayashikura* provides no teaching of applying its millimeter band signal to wireless indoor communication systems. *Fortune* provides no teaching of applying its technique for predicting the indoor coverage area of wireless transmission systems using ray tracing approaches to a radar system.

Furthermore, Appellants submit that there is no teaching in Fortune of modifying radar devices into alternative arrangements provided in *Fortune's* disclosed prediction technique for indoor wireless communication systems. In particular, Appellants submit that modifying *Hayashikura's* radar to include simultaneous reception of a plurality of millimeter band signal waves output from a plurality of transmitters having the same frequency would render its radar unsatisfactory for its intended purpose. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

No particular findings as to why the two pieces of prior art are combinable have been provided to suggest that it is knowledge of persons of ordinary skill in the art that Fortune's indoor high frequency band signal would be modified with the millimeter band signal.

Instead, Appellants submit that the rational of "in order to obtain microwave and above frequencies in the same continuous wireless radio spectrum for more practical applications, i.e. local multipoint distribution services in the indoor environment of Fortune et al, which serves as intended commercial use purpose" is a broad conclusory statement, not "evidence."

Thus, Appellants submit that the rejection has failed to establish a teaching, suggestion, or motivation to combine *Fortune* and *Hayashikura*.

Appellant respectfully disagrees that *Fortune*, *Hayashikura* and *Katz* suggests the desirability of the claimed invention (**M.P.E.P.** § 2143.01).

b. One of ordinary skill in the art would not have been motivated to combine *Fortune, Hayashikura,* and *Katz* in a manner of the claimed invention.

The rejection admits that *Fortune* and *Hayashikura* do not explicitly teach a main lobe and a side lobe in an antenna for receiving the millimeter wave simultaneously. The rejection further states that, "it is notoriously old and well known in the art that a main lobe and a side lobe is part of a conventional directional antenna for receiving the millimeter wave simultaneously as taught by Katz." Appellants agree that a main lobe and a side lobe can be formed in a directional antenna. Appellants disagree that Katz teaches receiving a millimeter wave simultaneously over a plurality of propagation paths. Katz's statement that a single wave is unlikely to be received from just a single direction due to side lobes, only indicates that RF signals may be developed at side lobes, not millimeter band signal waves received simultaneously by a receive antenna. In any case, the invention according to claim 11 is an

arrangement between transmitters transmitting a respective millimeter band signal and a receiver receiving the millimeter band signal waves simultaneously from the transmitters.

Regarding the combination of *Fortune*, *Hayashikura* and *Katz*, the rejection states that, "it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a main lobe and a side lobe in order to receive multipath millimeter signals of the modified system of Fortune et al and Hayashikura et al from other lobes other than the one main beam lobe simultaneously since a signal is unlikely to come from just a single beam direction due to multipath effect as suggested by Katz (col. 8, lines 28-41)."

Katz is directed to an apparatus for directional radio communications, for example for a cellular communication network using space division multiple access (SDMA). SDMA is presented as a way of reducing the number of required base stations while increasing the size of each cell (Katz at col. 1, lines 38-56). SDMA allows two or more mobile stations to communicate at the same frequency from different locations within the same cell, leading to an increase in the amount of traffic which can be carried by the cellular network (Katz at col. 1, line 57, to col. 2, line 4).

Katz discloses that a problem with SDMA is that the direction in which signals should be transmitted to a mobile station needs to be determined (Katz at col. 2, lines 15-17). *Katz* discloses a solution using directional radio communication between a first station and a second station where the first station transmits signals in a number of beam directions at different phases. *Katz* discloses a base station that acts as a transceiver including an antenna array of preferably eight antenna elements (Katz at col. 7, lines 11-24).

Katz indicates that, "in practice, a signal is unlikely to be received from just a single beam direction due to side lobes and/or multipath effects." *Katz* goes on to state that, "the level or amplitude of the signal received in a number of beam directions will often be quite low and as such, in some embodiments of the present invention be disregarded." The butler matrix of *Katz* is disclosed as receiving on the antenna elements eight versions of the same signal which are phase shifted with respect to one another. (Katz at col. 8, lines 28-36).

Thus, Appellants submit that Katz does not teach an antenna having "a main lobe and a side lobe in order to receive multipath millimeter signals ... from other lobes other than the main beam lobe simultaneously." Furthermore, Appellants agree that *Katz* teaches that a signal is unlikely to be received from just a single beam direction due to multipath effect. However, the rational that "a signal is unlikely to come from just a single beam direction due to multipath effect as suggested by *Katz*" may be true, but does not provide a motivation to combine *Katz* with *Fortune* and *Hayashikura*. Therefore, insufficient evidence has been provided of a teaching, suggestion or motivation to combine the teachings of *Fortune*, *Hayashikura*, and *Katz*.

As such, Appellants maintain that independent claim 11 is patentable over *Fortune, Hayashikura* and *Katz*.

c. The Rejection of Independent Claim 11 fails to teach each and every claimed element

For at least the reasons presented herein, Appellants maintain that the rejection has failed to establish a *prima facie* case of obviousness because the rejection has failed to provide references that teach or suggest each and every feature as set forth in the claimed invention.

Thus, Appellants maintain that independent claim 1 is allowable over *Fortune, Hayashikura* and *Katz*.

"It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *In re Wesslau*, 147 USPQ 391, 393 (CCPA 1965).

The rejection appears to piece together features from unrelated context and allege that they teach sub-features within the claim. For example, the rejection relies on two references for teaching the single claimed element of a "stationary receiver."

In particular, the rejection alleges that *Fortune* teaches the claimed "plurality of stationary transmitters" which is set up at the transmitter point 210, but relies on *Hayashikura* for teaching the function of the transmitters of outputting "a plurality of millimeter band signal waves." The claim, however, is limited to "a plurality of stationary transmitters" outputting "a plurality of millimeter band signal waves." Appellants submit that *Fortune* fails to teach or suggest a plurality of transmitters outputting a plurality of millimeter band signals.

Of the cited references, only *Hayashikura* shows a transmitting antenna 14 supplied with a millimeter-band carrier wave signal that is radiated as an electromagnetic wave (*Hayashikura* at col. 3, lines 64-67). In particular, *Hayashikura* appears to teach a plurality of paired transmitter and receiver sections provided on and along a periphery of a vehicle, each transmitter section transmitting an electromagnetic wave, each of the receiver sections receiving a reflected wave from an object (*Hayashikura* at col. 2, lines 9-13). However, *Hayashikura* is directed to a radar where the transmitter transmits only a reflected beam to a respective receiver.

Further with regard to the claimed plurality of transmitters, the rejection refers to a section at column 6, lines 63-67, of Fortune.

Fortune at column 6, line 57, to column 7, line 7, states that,

> "It is to be understood that the concepts of the transmitter point and the receiver point are employed for analytical purposes to determine propagation path loss. Since propagation path loss is reciprocal, it is possible to exchange the roles of these points, such that the transmitter point becomes the receiver point and the receiver point becomes the transmitter point. Furthermore, it is to be understood that, in practice, an indoor wireless system may employ both transmitters and receivers at the receiver point location, and both transmitters and receivers may be used at the transmitter point. Alternatively, a transmitter may be used at the receiver point, and a receiver at the transmission point. For example, the transmitter point selected for purposes of propagation prediction is typically the proposed location of a system base station which includes a transceiver, whereas the receiver point is selected in the general location where portable units may contain transceivers."

Appellants disagree that this section teaches a plurality of stationary transmitters. Appellants submit that *Fortune* appears to suggest that either of a transmitter or a receiver can be at a transmitter point 210 (i.e., as a transceiver). Alternatively, *Fortune* suggests that either of a transmitter or receiver can be at a receiver point 212. Appellants do not find that *Fortune* teaches more than one point serving as respective plurality of transmitters having the same frequency, as

required in the claim. Appellants submit that *Fortune* does not teach two transmitters at the same transmitting point 210.

In the case of the single claimed element of a "stationary receiver," the rejection relies on three references. The rejection appears to rely on *Fortune* for teaching a stationary receiver at 212 including a receive antenna 215. The rejection appears to rely on *Hayashikura* for teaching the claimed receiving "a plurality of millimeter band signal waves." The rejection appears to rely on *Katz* for teaching a directional antenna having "a main lobe and a side lobe."

Appeallants submit that *Fortune* does not teach or suggest the "stationary receiver" as claimed. In particular, Appellants submit that *Fortune* fails to teach or suggest a stationary receiver including a receive antenna capable of receiving millimeter band signal waves.

Hayashikura is directed to radar devices provided along the periphery of a vehicle. *Katz* is directed to an apparatus for directional radio communication in a cellular communication network. *Katz* discloses a phase array antenna 6 having, in an example embodiment, eight antenna elements. *Katz* does appear to mention "side lobes" in the context of explaining an assumption that side lobes would be quite low and can be disregarded (*Katz* at col. 8, lines 28-33).

Thus, of the three references, only *Hayashikura* teaches a millimeter band signal transmitting/receiving system having a transmitter transmitting a millimeter band signal wave and a receiver receiving the millimeter band signal wave. *Fortune* and *Katz* do not appear to disclose transmitters/receivers capable of transmission of millimeter band signal waves. However, *Hayashikura* does not teach or suggest an arrangement where the receiver receives a

plurality of millimeter band signal waves simultaneously from a plurality of transmitters. Because *Hayashikura* is directed to a radar, an arrangement having a receiver receiving a plurality of millimeter band signal waves of the same frequency simultaneously from a plurality of transmitters would alter the preferred arrangement of a radar of a transmitter-receiver pair and thereby would render the radar of *Hayashikura* unsatisfactory for its intended purpose. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Therefore, Appellants submit that the rejection fails to establish *prima facie* obviousness since *Fortune*, *Hayashikura*, and *Katz* fail to teach at least the claimed "stationary receiver including a receive antenna having a main lobe and a side lobe arranged to simultaneously receive a plurality of millimeter band signal waves from said plurality of transmitters."

At least for these reasons, Appellants maintain that independent claim 11 is allowable over *Fortune, Hayashikura* and *Katz*.

d. Even if it could be said that there would be proper motivation to combine Fortune, Hayashikura, and Katz, the combination would still not teach or suggest the claimed invention of Claim 11

Appellants submit that *Fortune*, *Hayashikura*, and *Katz* would not lead one of ordinary skill in the art to an arrangement that would be different from that of the conventional solution disclosed in Manabe (present specification at section "Description of the Background Art").

In the approach taken by Manabe, one propagation path is selected for transmission at a time from a plurality of propagation paths, in order to avoid obstruction by an object, as well as to avoid multipath effects.

Appellants have determined that multipath effects can also be avoided by an arrangement where the plurality of transmitters transmit millimeter band signal waves at the same frequency and where the receiver includes a receive antenna having a main lobe and a side lobe arranged to simultaneously receive the plurality of signal waves.

Fortune specifically discloses a vertical half-wave dipole antenna (col. 5, lines 18-20; i.e., an omnidirectional RF antenna). For other types of antenna, *Fortune's* technique makes a simplifying assumption that path losses can be scaled by multiplying a total calculated path loss by the antenna power gain in the direction of interest (*Fortune* at col. 52-56). Appellants submit that even if a possibility of a different type of antenna were taken into consideration (e.g., directional antenna), there is still no teaching or suggestion that anything but the conventional arrangement of directive antennas for transmission of a single line of sight propagation path with minimum side lobes would be used.

Hayashikura is directed to a radar system having a single reflected propagation path. *Katz* indicates that signals received due to side lobes are often quite low and can be disregarded (*Katz* at col. 8, lines 28-33). Thus, the teachings of *Katz* or *Hayashikura* would not lead one of ordinary skill to a solution that would be anything but the solution suggested in Manabe of a single line of sight propagation path at a time with reduced side lobes.

Thus, at least for these additional reasons Appellants maintain that independent claim 11 is allowable over *Fortune, Hayashikura* and *Katz*.

C. The Examiner's Rejection over Fortune, Hayashikura, and Katz Fails to Establish *Prima Facie* Obviousness of Independent Claim 15

1. Argument Summary

Embodiments related to claim 15 are directed to a house provided with a millimeter band signal transmitting/receiving system including a structural component defining an internal space and a millimeter band signal transmitting/receiving system. Appellants submit that the same arguments as in the above for claim 1, apply as well to the millimeter band signal transmitting/receiving system of claim 15. The arguments apply as well to dependent claims 16, 17, 36, 37, and 40.

D. The Examiner's Rejection over Fortune, Hayashikura, and Katz Fails to Establish *Prima Facie* Obviousness of Independent Claim 18

1. Argument Summary

The Examiner's reasoning provided in support of the rejection of claim 18 under 35 U.S.C. §103(a) as being obvious under *Fortune, Hayashikura, and Katz* fails to establish *prima facie* obviousness. Specifically, the deficiencies of the rejection are that the rejection fails to establish proper motivation to combine the references, and even if the references could be combined they would still not teach or suggest each and every claimed feature. These deficiencies exist for the rejection of each of claims 19-23, 28-32.

2. Legal Requirements of *Prima Facie* Obviousness

To establish *prima facie* obviousness, all claim limitations must be taught or suggested by the prior art and the asserted modification or combination of the prior art must be supported by some teaching, suggestion, or motivation in the applied references or in knowledge generally available to one skilled in the art. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). The prior art must suggest the

desirability of the modification in order to establish a *prima facie* case of obviousness. *In re Brouwer*, 77 F.3d 422, 425, 37 USPQ2d 1663, 1666 (Fed. Cir. 1995). It can also be said that the prior art must collectively suggest or point to the claimed invention to support a finding of obviousness. *In re Hedges*, 783 F.2d 1038, 1041, 228 USPQ 685, 687 (Fed. Cir. 1986); *In re Ehrreich*, 590 F.2d 902, 908-909, 200 USPQ 504, 510 (C.C.P.A. 1979).

The teaching or suggestion to make the asserted combination or modification of the primary reference must be found in the prior art and cannot be gleaned from applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). In other words, the use of hindsight to reconstruct the claimed invention is impermissible. *Uniroyal Inc. v. Rudlan-Wiley Corp.*, 5 USPQ 1434 (Fed. Cir. 1983).

Finally, when considering the differences between the primary reference and the claimed invention, the question for assessing obviousness is not whether the differences themselves would have been obvious, but instead whether the claimed invention as a whole would have been obvious. *Stratoflex Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983).

3. The Rejection Fails to Establish *Prima Facie* Obviousness of Independent Claim 18

Embodiments of claim 18 are directed to a millimeter band signal transmitting/receiving system (e.g., millimeter band signal transmitting/receiving system shown in Figures 1-6), comprising:

at least one stationary transmitter transmitting a millimeter band signal (e.g., transmitter 1, or transmitters 10 and 11) through an associated transmit antenna (e.g., antenna 31 or antennas 31A and 31B) along a plurality of propagation paths including a line of sight propagation path (e.g., direct wave 4 and reflected wave 5, D wave or E wave);

a propagation path forming portion forming at least one indirect propagation path (e.g., reflected wave 5) for propagation of said millimeter band signal wave; and

a stationary receiver (e.g., receiver 2 or receiver 20) including a receive antenna having a main lobe and a side lobe (present specification at page 9, lines 5-8).

In a normal state when the line of sight propagation path is unobstructed, the receiver receives the millimeter band signal wave through each of the plurality of propagation paths including the line of sight propagation path (present specification at page 8, lines 11-13).

In an obstructed state when the line of sight propagation path is obstructed, the receiver receives the millimeter band signal through each of the plurality of propagation paths except the line of sight propagation path (present specification at page 8, lines 29-30).

In maintaining the rejection of claim 18, the Examiner alleges in the Office Action mailed January 26, 2006, on pages 10-11, the following:

> In regards to claim 18, *Fortune* discloses the following:
>
> a) at least one stationary transmitter at 210 transmitting a signal through an associated transmit antenna 211 along a plurality of propagation paths 217, 219 including a line of sight propagation path;
>
> b) a stationary receiver at 212 receiving the signal through the receive antenna (col. 5, lines 1-2);
>
> c) for the claimed normal state, the rejection refers to sections at column 5, lines 43-48, and column 6, lines 62-63;
>
> d) for the claimed obstructed state, the rejection refers to a section at column 5, line 57, to column 6, line 7.
>
> In regards to claim 18, *Fortune* fails to disclose the following:
>
> e) a millimeter band signal transmitting/receiving system, transmitting a millimeter band signal, receiving a millimeter band signal, and the receive antenna having a main lobe and a side lobe.

In regards to claim 18, *Hayashikura* discloses the following:

> f) a millimeter band signal transmitting/receiving system, a transmitter transmitting a millimeter band signal, and a receiver receiving a reflected millimeter band signal (col. 2, lines 7-18; col. 3, lines 55-67).

As a motivation to combine *Fortune* and *Hayashikura* the rejection states:

> g) "It would have been obvious to one of ordinary skill in the art at the time the invention was made to include in the indoor radio frequency propagation signal of Fortune et al the high frequency millimeter band signal in order to fully utilize the continuous radio frequency spectrum to include higher microwave frequencies that has more industrial applicability to practical commercial purposes with the advantage of small output power and measuring of signals for reflective and radiation loss as in Fortune et al (col. 6, lines 52-56)."

Appellants respectfully disagree that *Fortune* and *Hayashikura* suggests the desirability of the claimed invention (**M.P.E.P.** § 2143.01).

a. One of ordinary skill in the art would not have been motivated to combine *Fortune* and *Hayashikura* in a manner of the claimed invention.

To establish obviousness based on a combination of elements disclosed in the prior art, there must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant. The motivation suggestion or teaching may come explicitly from the statements in the prior art, the knowledge of one of ordinary skill in the art, or in some cases, the nature of the problem to be solved. See *In re Dembiczak*, 50 USPQ2d 1614 (Fed.Cir. 1999). The CAFC has held that even though various elements of the claimed invention were present (in two separate embodiments of the same prior art reference), there was no motivation to combine the elements from the separate embodiments, based on the teachings in the prior art. See *In re Kotzab*, 55 USPQ2d 1313 (Fed.Cir. 2000).

In order to establish a *prima facie* case of obviousness under 35 U.S.C. §103(a), the Examiner must provide particular findings as to why the two pieces of prior art are combinable. See Dembiczak 50 USPQ2d at 1617. Broad conclusory statements standing alone are not "evidence".

The statement in the rejection of a motivation to combine *Fortune* and *Hayashikura* states that it would have been obvious to one of ordinary skill in the art "to include in the indoor frequency propagation signal of Fortune et al the high frequency millimeter band signal in order to fully utilize the continuous radio frequency spectrum to include higher microwave frequencies …". To the contrary, *Hayashikura* is directed to a plurality of radar devices provided on and along the periphery of a vehicle for monitoring in different directions. *Hayashikura* provides no teaching of applying its millimeter band signal to indoor wireless indoor communication systems. *Fortune* provides no teaching of applying its technique for predicting the indoor coverage area of wireless transmission systems using ray tracing approaches to a radar system.

Furthermore, Appellants submit that there is no teaching in Fortune of modifying radar devices into alternative arrangements provided in *Fortune's* disclosed prediction technique for indoor wireless communication systems. In particular, Appellants submit that modifying *Hayashikura's* radar to include a line of sight propagation path between the transmitter and receiver would render its radar unsatisfactory for its intended purpose. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

No particular findings as to why the two pieces of prior art are combinable have been provided to suggest that it is knowledge of persons of ordinary skill in the art that *Fortune's* indoor signal would be modified to include a millimeter band signal.

Instead, Appellants submit that the rational of "in order to fully utilize the continuous spectrum to include higher microwave frequencies that has more industrial applicability to practical commercial purposes with the advantage of small output power" is a broad conclusory statement, not "evidence."

Thus, Appellants submit that the rejection has failed to establish a teaching, suggestion, or motivation to combine *Fortune* and *Hayashikura*.

Appellants respectfully disagree that *Fortune*, *Hayashikura,* and *Katz* suggests the desirability of the claimed invention (**M.P.E.P.** § 2143.01).

b. One of ordinary skill in the art would not have been motivated to combine *Fortune*, *Hayashikura* and *Katz* in a manner of the claimed invention.

The rejection admits that *Fortune* and *Hayashikura* do not explicitly teach a main lobe and a side lobe in an antenna for receiving the millimeter wave simultaneously. The rejection further states that, "it is notoriously old and well known in the art that a main lobe and a side lobe is part of a conventional directional antenna as taught by Katz." Appellants agree that a main lobe and a side lobe can generally be formed in a directional antenna. However, the invention according to claim 18 is an arrangement between a transmitter transmitting a millimeter band signal through an associated antenna along a plurality of propagation paths including a line of sight propagation path between the associated transmit antenna and a receive

antenna, wherein in an obstructed state when the line of sight propagation path is obstructed, the receiver receives the millimeter band signal through each of the propagation paths except the line of sight propagation paths. The receiver receiving the millimeter band signal through the receive antenna has a main lobe and a side lobe.

Regarding the combination of *Fortune*, *Hayashikura* and *Katz*, the rejection states that, "it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a main lobe and a side lobe in order to receive the multipath millimeter signals of the modified system of Fortune et al and Hayashikura et al from other lobes other than the one main beam lobe since a signal is unlikely to come from just a single beam direction due to multipath effect as suggested by Katz (col. 8, lines 28-41)."

Katz is directed to an apparatus for directional radio communications, for example for a cellular communication network using space division multiple access (SDMA). SDMA is presented as a way of reducing the number of required base stations while increasing the size of each cell (Katz at col. 1, lines 38-56). SDMA allows two or more mobile stations to communicate at the same frequency from different locations within the same cell, leading to an increase in the amount of traffic which can be carried by the cellular network (Katz at col. 1, line 57, to col. 2, line 4).

Katz discloses that a problem with SDMA is that the direction in which signals should be transmitted to a mobile station needs to be determined (Katz at col. 2, lines 15-17). *Katz* discloses a solution using directional radio communication between a first station and a second station where the first station transmits signals in a number of beam directions at different

phases. *Katz* discloses a base station that acts as a transceiver including an antenna array of preferably eight antenna elements (Katz at col. 7, lines 11-24).

Katz indicates that, "in practice, a signal is unlikely to be received from just a single beam direction due to side lobes and/or multipath effects." *Katz* goes on to state that, "the level or amplitude of the signal received in a number of beam directions will often be quite low and as such, in some embodiments of the present invention be disregarded." The butler matrix of *Katz* is disclosed as receiving on the antenna elements eight versions of the same signal which are phase shifted with respect to one another. (Katz at col. 8, lines 28-36).

Thus, Appellants agree that *Katz* teaches that a signal is unlikely to be received from just a single beam direction due to multipath effect. However, the rational that "a signal is unlikely to come from just a single beam direction due to multipath effect as suggested by *Katz*" does not provide a motivation to combine *Katz* with *Fortune* and *Hayashikura*. Therefore, insufficient evidence has been provided of a teaching, suggestion or motivation to combine the teachings of *Fortune*, *Hayashikura*, and *Katz*.

As such, Appellant maintains that independent claim 18 is patentable over *Fortune, Hayashikura* and *Katz*.

c. The Rejection of Independent Claim 18 fails to teach each and every claimed element

For at least the reasons presented herein, Appellant maintains that the rejection has failed to establish a *prima facie* case of obviousness because the rejection has failed to provide references that teach or suggest each and every feature as set forth in the claimed invention.

Thus, Appellant maintains that independent claim 18 is allowable over *Fortune, Hayashikura* and *Katz.*

"It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *In re Wesslau*, 147 USPQ 391, 393 (CCPA 1965).

The rejection appears to piece together features from unrelated context and allege that they teach sub-features within the claim. For example, the rejection relies on two references for teaching the claimed element of "at least one stationary transmitter" and three references for teaching the claimed element of a "stationary receiver."

In particular, the rejection alleges that *Fortune* teaches the claimed "stationary transmitter" at 210, but relies on *Hayashikura* for teaching the function of the transmitter of "transmitting a millimeter band signal." The claim, however, is limited to "at least one stationary transmitter transmitting a millimeter band signal." Appellants submit that *Fortune* fails to teach or suggest a transmitter transmitting a millimeter band signal.

Of the cited references *Fortune* and *Hayashikura*, only *Hayashikura* shows a transmitting antenna 14 supplied with a millimeter-band carrier wave signal that is radiated as an electromagnetic wave (*Hayashikura* at col. 3, lines 64-67). In particular, *Hayashikura* appears to teach a plurality of transmitter and receiver sections provided on and along a periphery of a vehicle, each transmitter sections transmitting an electromagnetic wave, each of the receiver sections receiving a reflected wave from an object (*Hayashikura* at col. 2, lines 9-13). However,

Hayashikura is directed to a radar where the transmitter transmits only a reflected beam to a respective receiver.

In the case of the claimed "stationary receiver," the rejection relies on three references. The rejection appears to rely on *Fortune* for teaching a stationary receiver including a receive antenna. The rejection appears to rely on *Hayashikura* for teaching the claimed "receiving the millimeter band signal." The rejection appears to rely on *Katz* for teaching a directional antenna having "a main lobe and a side lobe."

Appellants submit that *Fortune* does not teach or suggest the "stationary receiver" as claimed. In particular, Appellants submit that *Fortune* fails to teach or suggest a stationary receiver including a receive antenna capable of receiving a millimeter band signal.

Hayashikura is directed to a radar devices provided along the periphery of a vehicle. *Katz* is directed to an apparatus for directional radio communication in a cellular communication network. *Katz* discloses a phase array antenna 6 having, in an example embodiment, eight antenna elements. *Katz* does appear to mention "side lobes" in the context of explaining an assumption that side lobes would be quite low and can be disregarded (*Katz* at col. 8, lines 28-33).

Thus, of the three references, only *Hayashikura* teaches a millimeter band signal transmitting/receiving system having a transmitter transmitting a millimeter band signal wave and a receiver receiving the millimeter band signal. *Fortune* and *Katz* do not appear to disclose transmission of millimeter band signals. However, *Hayashikura* does not teach or suggest an arrangement where the transmitter transmits a millimeter band signal through an associated antenna along a plurality of propagation paths including a line of sight propagation path between

the associated transmit antenna and a receive antenna. Because *Hayashikura* is directed to a radar, an arrangement having a line of sight propagation path between a transmit antenna and a receive antenna would render the radar of *Hayashikura* unsatisfactory for its intended purpose. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Therefore, Appellants submit that the rejection fails to establish *prima facie* obviousness since *Fortune*, *Hayashikura*, and *Katz* fail to teach at least the claimed "at least one stationary transmitter transmitting a millimeter band signal through an associated transmit antenna along a plurality of propagation paths of said millimeter band signal formed by said associated transmit antenna including a line of sight propagation path between said associated transmit antenna and a receive antenna," and "a stationary receiver receiving the millimeter band signal through said receive antenna having a main lobe and a side lobe."

Furthermore, embodiments related to claim 18 are directed to a millimeter band signal transmitting/receiving system including, among other things, at least one stationary transmitter and a stationary receiver. The claimed transmitter and receiver have both a normal state and an obstructed state.

The rejection states that *Fortune's* transmit antenna 211 teaches the claimed transmit antenna, and that propagation paths 217 and 219 teach the claimed plurality of propagation paths formed by the transmit antenna. The rejection states that Fortune's receive antenna 215 teaches the claimed receive antenna. Furthermore, the rejection states that a section in *Fortune* pertaining to the recursive analysis approach to predicting propagation teaches the claimed "normal state"

and "obstructed state." In particular, with respect to the "normal state" the rejection relies on a section in *Fortune* which states that,

> "The propagation prediction process begins with the calculation of a received power value for a direct path 217 from transmitter point 210 to receiver point 212. This direct path 217 is the straight-line path from the transmitter point 210 to the receiver point 212, which may or may not pass through a surface such as a wall, but which does not include reflections from surfaces." (Fortune at column 5, lines 43-49.)

The rejection also points to a statement in *Fortune* which discusses the alternative roles at each transmitter point and receiver point, as teaching the function of the claimed receiver in the normal state (referring to column 6, lines 62-63). Appellants do not understand why this section is referred to.

With respect to the "obstructed state," the rejection relies on a section in *Fortune* which states that,

> "Transmission losses result when the propagation path passes through an obstruction such as a surface. This transmission loss is determined and normalized in accordance with the recursive procedures set forth above and described in greater detail in the aforementioned Ramo textbook. For example, if the direct path does not include any obstacles, the normalized transmission loss is 1, whereas if an obstacle completely blocks an RF signal, the normalized transmission loss is 0. The total propagation loss for the direct path is calculated as the product of the free-space loss and the normalized transmission losses. The power received at the receiver point 212 from the direct path may be determined from the total direct path propagation loss. These calculations are well known to those skilled in the art, and are performed using conventional methods such as those set forth in the Ramo reference. Next, received power for all one-reflection paths 219 are calculated, followed by all paths involving two reflections." (Column 5, line 57, to column 6, line 7.)

The rejection relies on a section in *Fortune* for teaching the function of the claimed receiver in the obstructed state, which states that,

> "Note that reflection path losses and direct path losses can be scaled for different types of antennas simply by multiplying the total calculated path loss by the antenna power gain in the direction of interest." (Column 6, lines 52-56.)

Appellants assume that the purpose of the later section is to show that the receive antenna of *Fortune* can be alternative types of antennas, and to take into account an alternative type of antenna, the power calculation involves antenna power gain for the type of antenna.

In any case, Appellants submit that *Fortune* fails to teach a stationary antenna that has both a normal state and an obstructed state as recited in claim 18. For example, *Fortune* fails to teach temporary blockage of a received signal. Unlike *Fortune*, the present claimed invention includes, among other things, a stationary transmitter having an associated transmit antenna transmitting a signal along a plurality of propagation paths including a line of sight propagation path to a receive antenna of a stationary receiver. In a normal state, the line of sight propagation path between the stationary transmitter and the stationary receiver is unobstructed. In an obstructed state, the line of sight propagation path between the stationary transmitter and the stationary receiver is obstructed.

In *Fortune*, on the other hand, for a given transmitter point 210 to a given receiver point 212, a total direct path propagation loss will be calculated. The total propagation loss would be based on factors including path length (free-space loss), losses due to a path through an obstruction, or due to obstacles. In other words, for a given pair of points used in the path prediction, there is only one state, which could be any of a continuum of unobstructed path to an

obstructed path depending on obstructions and/or obstacles along the path. (e.g., see examples illustrated in Figures 7-9).

At least for these reasons, Appellants maintain that independent claim 18 is allowable over *Fortune, Hayashikura* and *Katz*.

d. Even if it could be said that there would be proper motivation to combine Fortune, Hayashikura, and Katz, the combination would still not teach or suggest the claimed invention of Claim 18

Appellants submit that *Fortune*, *Hayashikura*, and *Katz* would not lead one of ordinary skill in the art to an arrangement that would be different from that of the conventional solution disclosed in Manabe (present specification at section "Description of the Background Art").

As discussed above in the "Summary of the Claimed Subject Matter", Manabe teaches a solution to the problem of obstruction of millimeter band signal waves of selecting between alternative radio wave paths, choosing one line of sight path at a time. As pointed out by Appellants, when more than one propagation path is simultaneously received by a receiver (e.g., via a direct propagation path and a delayed indirect propagation path from a previously transmitted signal wave), a problem of unsatisfactory effects from multiple paths occurs (specification at page 8). Thus, conventional direct transmission of millimeter band signal waves is done by reducing side lobes as much as possible. There is no teaching in *Fortune, Hayashikura* or *Katz* that would lead one of ordinary skill in the art to anything but a conventional arrangement of directive antennas for single line of sight transmission of a millimeter band signal wave with reduced side lobes.

Fortune only specifically discloses a vertical half-wave dipole antenna (col. 5, lines 18-20; i.e., an omnidirectional RF antenna). For other types of antenna, *Fortune's* technique makes a simplifying assumption that path losses can be scaled by multiplying a total calculated path loss by the antenna power gain in the direction of interest (*Fortune* at col. 52-56). Appellants submit that even if a possibility of a different type of antenna were taken into consideration (e.g., directional antenna), there is still no teaching or suggestion in *Fortune, Hayashikura*, or *Katz* that anything but the standard single line of sight propagation path with minimum side lobes would be used.

Hayashikura is directed to a radar system having a single reflected propagation path. *Katz* indicates that signals received due to side lobes are often quite low and can be disregarded (*Katz* at col. 8, lines 28-33). Thus, the teachings of *Katz* or *Hayashikura* would not lead one of ordinary skill to a solution that would be anything but the solution suggested in Manabe of transmission of single line of sight propagation path at a time with reduced side lobes.

Thus, at least for these additional reasons Appellants maintain that independent claim 18 is allowable over *Fortune, Hayashikura* and *Katz*.

E. The Examiner's Rejection under the combination of *Fortune, Hayashikura, Katz, and Kagami* Fails to Establish *Prima Facie* Obviousness of dependent Claims 12 and 24

1. Argument Summary

The Examiner's reasoning provided in support of the rejection of dependent claims 12 and 24 under 35 U.S.C. §103(a) as being obvious under the combination of *Fortune, Hayashikura, and Katz* in view of *Kagami* fails to establish *prima facie* obviousness.

Specifically, the deficiencies of the rejection are that *Kagami* fails to make up for the deficiencies of *Fortune, Hayashikura* and *Katz* of failing to teach or suggest at least the additional elements recited in the respective claims 12 and 24. The argument applies as well to claims 13, 25 and 26.

2. The Rejection Fails to Establish *Prima Facie* Obviousness of dependent Claims 12 and 24

Embodiments of claim 12 are directed to the millimeter band signal transmitting/receiving system according to claim 11 wherein each of the plurality of transmitters includes a local oscillator oscillating at a prescribed local oscillator frequency.

In maintaining the rejection of claim 12, the Examiner alleges in the Office Action mailed January 26, 2006, on pages 17-18, the following:

> <u>In regards to claim 12, *Fortune, Hayashikura, Katz* fail to disclose the following:</u>
>
> a) the further limitation recited in claim 12
>
> However, *Kagami* discloses wherein each of the plurality of transmitters includes a local oscillator oscillating at a prescribed local oscillator frequency for generating the signal wave at the same frequency (referring to col. 9, lines 25-36, of Kagami). The rejection further states that it would have been obvious to one of ordinary skill in the art at the time the invention was made "for two transmitters to have a common frequency via a common local oscillator in order to convert the reference frequency to the desired frequency band signal."

Appellant respectfully disagrees that the combination of *Fortune, Hayashikura, Katz* and *Kagami* discloses that the claimed plurality of transmitters includes a local oscillator at a prescribed local oscillator frequency for generating the signal wave at the same frequency.

a. *Kagami,* like Fortune, Hayashikura, Katz, Fails to teach a Claimed Limitation

Appellants agree that *Kagami* does appear to teach a common local oscillator in a repeater and in a transmitting terminal (e.g., common reference oscillator 104 of Fig. 6A; common oscillator 321 of Fig. 10). Figure 9 of *Kagami* shows embodiments of transmitting frequencies and receiving frequencies in a non-regenerative repeater station. The common reference frequency is a common divisor of all the local frequencies for all the radio frequencies for all the sub-system signals (col. 6, lines 28-30). As an example, local frequencies associated with a go-channel may be 5825, 5885 and 5945 MHz (col. 9, lines 26-28). The common reference oscillator 104 supplies all repeater sub-units so that each sub-system signal is frequency converted by a local frequency which is in phase with another local frequency for another sub-system signal (col. 6, lines 1-10). Thus, the common oscillator is for carrying out frequency conversion and not for producing a signal wave at the same frequency.

Figure 10 shows another embodiment of a non-regenerative digital radio-relay system based on cross polarization communication. In the case of cross polarization, two transmitters are supplied a common reference frequency for frequency conversion by the common reference oscillator 321 so that the radio frequency of a H-polarized wave of the first transmitter is in-phase with that of the V polarized wave of the second transmitter. Again the common reference frequency is for frequency conversion in-phase by local oscillators 322-1 and 322-2, not for producing a signal wave at the same frequency.

Kagami does not appear to teach an arrangement having a plurality of transmitters and a receiver receiving a plurality of signal waves output from the plurality of transmitters. *Kagami* does not appear to teach transmitters each having a local oscillator oscillating at a prescribed local oscillation frequency for generating a signal wave at the same frequency.

To the contrary, embodiments related to claims 11 and 12 do not include a common local oscillator. Embodiments related to claims 11 and 12 include a receiver including a receive antenna receiving a plurality of signal waves of the same frequency output from the plurality of transmitters. Unlike *Kagami*, each of the plurality of transmitters of claim 12 include a local oscillator oscillating at a prescribed local oscillator frequency for generating the signal wave at the same frequency.

For at least the reasons presented herein, Appellants maintain that the Examiner has failed to establish a *prima facie* case of obviousness because the Examiner has failed to provide references that teaches or suggests each and every feature as set forth in the claimed invention. Thus, Appellant maintains that dependent claim 12 is allowable over the combination of *Fortune, Hayashikura, Katz* and *Kagami.*

Embodiments related to claim 24 include two transmitters and associated two transmit antennas, each of the two associated transmit antennas provides a separate line of sight propagation path to a receive antenna, the stationary receiver receiving the millimeter band signal through the receive antenna.

In maintaining the rejection of claim 24, the Examiner alleges in the Office Action mailed January 26, 2006, on pages 18, the following:

> In regards to claim 24, *Fortune, Hayashikura, Katz* fail to disclose the following:
>
> a) the at least one transmitter includes two transmitters and two associated transmit antennas, wherein each of the two associated transmit antennas provides a separate line of sight propagation path to the receive antenna.
>
> The rejection instead relies on Kagami for teaching the claimed two transmitters and two associated transmit antennas providing a separate line of sight propagation path to the receive antenna. The rejection goes on to state that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have two transmitters "in order to insure that the signal can

be transmitted via diversity transmission." The rejection appears to rely on Fortune for teaching the receiver receiving the signal through the receive antenna.

b. *Kagami,* like Fortune, Hayashikura, Katz, Fails to teach a Claimed Limitation

To the contrary, *Kagami's* repeater station in Figure 10 has two receivers associated with the two transmitters. *Kagami's* two transmitters 322-1 and 322-2 transmit through one antenna 326. *Kagami's* arrangement in Fig. 10 is concerned with transmitting cross polarized waves, i.e., a technique for transmitting waves over the same propagation path. Thus, *Kagami* does not appear to be concerned with transmitting a millimeter band signal along a plurality of propagation paths.

Appellants maintain that claims 12, 13, 24-26 are allowable over the combination of *Fortune*, *Hayashikura*, *Katz*, and *Kagami*.

F. The Examiner's Rejection under the combination of *Fortune, Hayashikura, Katz, and Evans* Fails to Establish *Prima Facie* Obviousness of dependent Claim 27

1. Argument Summary

The Examiner's reasoning provided in support of the rejection of dependent claim 27 under 35 U.S.C. §103(a) as being obvious under the combination of *Fortune, Hayashikura, and Katz* in view of *Evans* fails to establish *prima facie* obviousness. Specifically, the deficiencies of the rejection are that *Evans* fails to make up for the deficiencies of *Fortune*, *Hayashikura* and *Katz*.

G. The Examiner's Rejection under the combination of *Fortune, Hayashikura, and Katz in view of Bae* Fails to Establish *Prima Facie* Obviousness of dependent Claims 41-46

Embodiments related to claim 41 are directed to a millimeter band signal transmitting/receiving system of claim 1, wherein the intensity of the signal wave received from the indirect propagation path is substantially the same intensity of the signal wave received from the line of sight propagation path.

The rejection states that *Fortune*, *Hayashikura* and *Katz* do not disclose the limitation recited in claim 41. Instead, the rejection relies on *Bae* for teaching the limitation, stating that *Bae* teaches that, the "intensity of indirect signal with direct signal is compared via attenuation constant of the ghost depending on different conditions from which the multipath signals are received" (referring to Bae at col. 1, lines 15-55).

Appellants submit that the section at col. 1, lines 15-55, teaches the conditions for "ghost" and a way of quantifying those conditions. Appellants disagree that *Bae* teaches the claimed limitation, and especially disagree that *Bae* teaches intensity of a millimeter band signal wave. *Bae* relies on a conventional broadcasting system, and teaches compensation for multi-path problems at the receiving end.

Bae at col. 1, lines 15-55, describes Fig. 1 as that,

> "The TV broadcasting signal may be transmitted to a TV receiver 14 at a reception antenna 14A, taking both a direct path C1 and indirect path C2 and C3, such as a mountain 12 and a large building 13. A channel with plural broadcasting signal transmission paths is called a multi-path channel. Since a field intensity of the broadcasting signal received at the TV receiver 14

through the direct path C1 is high, the broadcasting signal is displayed on a screen bright and clear, while a field intensity of the broadcasting signal received at the TV receiver 14 through the indirect path C2 or C3, i.e., a ghost, is low, the broadcasting signal is displayed on a screen hazy. The ghost in an actual broadcasting channel appears, not only as a difference of brightness simply, but also various forms, such as a color distortion and an orthogonal distortion. 14B shown on the TV screen is a normal image, and 14C is a ghost. The ghost can be expressed with three parameters of a delay time, an attenuation constant, and a phase shift. The time delay, a parameter for representing a reception time difference of the broadcasting signal depending on a difference of path distances, is represented in a relative time difference of signal arrival with reference to a signal received through a main path in μsec units. A ghost with a delay time less than "0" is called a full ghost, and a ghost with a little delay time compared to the main signal is called a near ghost. The near ghost in general is a ghost occurred near the main signal with 1~2 μsec. and most of the ghosts we see in general ambient are these type of ghosts. The attenuation constant represents a degree of intensity of a signal through an indirect path with respect to a signal through a main path, i.e., an intensity of a signal compared to the main path. Phases of signal carriers through different paths in the multi-oath channel differ from a phase of a main path signal carrier, which is represented as the parameter of phase shift.

As can be known from the ghost parameters, the ghost is dependent on time, broadcasting environment, and broadcasting channel. Conditions of ghost generation vary depending, for example, reflection characteristic changes of reflecting bodies

> depending on environments, carrier frequencies transmitted from broadcasting stations, and the like, according to which a form of ghost is also changed."

As can be seen at lines 20-26, *Bae* explicitly states that the field intensity of the broadcasting signal received through the direct path C1 is high, while the field intensity of the broadcasting signal received through the indirect path C2 or C3 is low. *Bae* defines "attenuation constant" as a degree of intensity of a signal through an indirect path with respect to a signal through a main path (col. 1, lines 42-45). *Bae's* solution to the multi-path problem is to include a method for correcting color distortion that includes a multi-path channel estimation step." Appellants submit that *Bae* does not teach or suggest at least an aspect of level of the intensity of a signal in the indirect path sufficient to obtain an intensity of a signal wave received from an indirect propagation path that is substantially the same as the intensity of the signal wave received from the line of sight propagation path.

Furthermore, because *Bae* is directed to conventional broadcasting signal transmission that assumes direct and indirect propagation paths, *Bae's* system is limited to control over the design of the TV receiver, i.e., relies on a predetermined broadcasting transmitter. Affects from multi-path such as ghost are presumed in the transmitted paths and handled at the receiving end by the disclosed method.

Claim 42 further limits the intensity relationship recited in claim 41 to a condition where the intensity of the signal wave received from the indirect propagation path is at least 3dB greater than the intensity of the signal wave received from the line of sight propagation path.

The rejection refers to the same section in *Bae* for teaching this claimed limitation as was referred to in the rejection of claim 41. In the section at column 1, Appellants only find a teaching that the intensity of the broadcasting signal received through the indirect path would be low (col. 1, lines 23-26). Appellants find no teaching or suggestion that the intensity would be at least 3dB greater than the intensity from the line of sight propagation path.

Embodiments relating to claim 43 are directed to the millimeter band signal transmitting/receiving system of claim 1, wherein the stationary receiver receives a millimeter band signal wave having a carrier to noise ratio of at least 8dB when the line of sight propagation path signal is interrupted.

The rejection admits that neither of *Fortune*, *Hayashikura*, *Katz*, nor *Bae* teach this limitation. Instead, the rejection states that, "it is well known in the art that determining carrier to noise ratio result from measuring signal intensity of the indirect signal path and comparing it with the main signal path, which may or may not be received based on the broadcasting channel and broadcasting environment. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to have the carrier to noise ratio in order to determine how much distortion there is in the indirect path with respect to the main path as suggested by Bae et al." (referring to col. 1, lines 20-55). Appellants submit that even if this statement is true, it still does not render obvious the claimed limitation of a carrier to noise ratio of at least 8dB when the line of sight propagation path signal wave is interrupted.

Again, *Bae* explicitly discloses that intensity of a broadcasting signal received from an indirect path would be low. Furthermore, *Bae* pertains to a conventional broadcasting system transmitting at conventional TV broadcasting frequencies (e.g., VHF, UHF), and does not teach a

millimeter band signal being transmitted as the broadcasting signal. There is nothing to indicate that *Bae* would teach anything other than the arrangement in Manabe.

The arguments above for claims 41, 42, and 43, apply as well to claims 44, 45, and 46, respectively.

VIII. CLAIMS

A copy of the claims involved in the present appeal are attached hereto as Appendix A.

IX. EVIDENCE

There is no additional evidence pursuant to §§ 1.130, 1.131, or 1.132 and/or evidence entered by or relied upon by the examiner that is relevant to this appeal as noted in Appendix B.

X. RELATED PROCEEDINGS

No related proceedings are referenced in II. above, and thus, no copies of decisions in related proceedings are provided, as Noted in Appendix C.

XI. CONCLUSION

The withdrawal of the outstanding rejections and the allowance of claims 1-48 are earnestly solicited.

The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§ 1.16, 1.17, and 1.21 that may be required by this paper and to credit any overpayment to Deposit Account No. 02-2448.

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APPENDIX A

Claims Involved in the Appeal of Application Serial No. 09/400,974 are as follows:

1. A millimeter band signal transmitting/receiving system, comprising:

a stationary transmitter transmitting a millimeter band signal wave;

a propagation path forming portion forming at least one indirect propagation path for propagation of said millimeter band signal wave; and

a stationary receiver including a receive antenna having a main lobe and a side lobe receiving said millimeter band signal wave simultaneously from a plurality of propagation paths including a line of sight propagation path to said transmitter and said at least one indirect propagation path, and receiving said millimeter band signal wave from at least one of said plurality of propagation paths.

2. The millimeter band signal transmitting/receiving system according to claim 1, wherein said propagation path forming portion includes a reflector arranged to reflect said signal wave transmitted from said transmitter and direct said reflected signal wave to said receiver.

3. The millimeter band signal transmitting/receiving system according to claim 2, wherein said reflector is arranged substantially in parallel to a line of sight between said transmitter and said receiver.

4. The millimeter band signal transmitting/receiving system according to claim 2, wherein said reflector has a thin film including aluminum.

5. The millimeter band signal transmitting/receiving system according to claim 2, wherein said reflector has a surface covered by an insulating material.

6. The millimeter band signal transmitting/receiving system according to claim 2, wherein said reflector has a surface covered by a transparent insulating material.

7. The millimeter band signal transmitting/receiving system according to claim 2, wherein a plurality of said reflectors are arranged to form said plurality of propagation paths for propagating said signal waves to said receiver.

8. The millimeter band signal transmitting/receiving system according to claim 1, wherein said receiver always simultaneously receives said plurality of signal waves from said plurality of propagation paths in a normal state.

9. The millimeter band signal transmitting/receiving system according to claim 1, wherein said receiver and said transmitter are provided inside a house,

said propagation path includes a structural component defining an internal space of said house and reflecting a signal wave transmitted from said transmitter, and

said transmitter is spaced by a prescribed distance from said structural component defining said internal space of said house for transmitting said signal wave at a prescribed transmission angle.

10. The millimeter band signal transmitting/receiving system according to claim 9, wherein each of said prescribed distance and said prescribed transmission angle is determined depending on a region for propagation of said plurality of signal waves and a positional relationship between said transmitter and said receiver.

11. A millimeter band signal transmitting/receiving system, comprising:

a plurality of stationary transmitters; and

a stationary receiver including a receive antenna having a main lobe and a side lobe arranged to simultaneously receive a plurality of millimeter band signal waves output from said plurality of transmitters,

said plurality of millimeter band signal waves being transmitted from said plurality of transmitters having a same frequency.

12. The millimeter band signal transmitting/receiving system according to claim 11, wherein each of said plurality of transmitters includes a local oscillator oscillating at a prescribed local oscillator frequency for generating said signal wave at said same frequency.

13. The millimeter band signal transmitting/receiving system according to claim 12, wherein said local oscillators are in synchronization with each other.

14. The millimeter band signal transmitting/receiving system according to claim 11, wherein said receiver always simultaneously receives said plurality of signal waves in a normal state.

15. A house provided with a millimeter band signal transmitting/receiving system including a structural component defining an internal space and a millimeter band signal transmitting/receiving system, wherein said millimeter band signal transmitting/receiving system comprises:

a stationary transmitter transmitting a millimeter band signal wave;

a propagation path forming portion arranged in said structural component for forming at least one indirect propagation path for propagation of said millimeter band signal wave; and

a stationary receiver including a receive antenna having a main lobe and a side lobe receiving said millimeter band signal wave simultaneously through a plurality of propagation paths including a line of sight propagation path to said transmitter and said at least one indirect propagation path.

16. The house provided with the millimeter band signal transmitting/receiving system according to claim 15, wherein said propagation path forming portion has a reflector reflecting an output from said transmitter and said reflector is arranged on a surface of said component.

17. The house provided with the millimeter band signal transmitting/receiving system according to claim 15, wherein said propagation path forming portion has a reflector reflecting an output from said transmitter and said reflector is arranged inside said component.

18. A millimeter band signal transmitting/receiving system, comprising:

at least one stationary transmitter transmitting a millimeter band signal through an associated transmit antenna along a plurality of propagation paths of said millimeter band signal formed by said associated transmit antenna including a line of sight propagation path between said associated transmit antenna and a receive antenna;

a stationary receiver receiving the millimeter band signal through said receive antenna having a main lobe and a side lobe,

wherein, in a normal state when said line of sight propagation path is unobstructed, said receiver receives the millimeter band signal through each of the plurality of propagation paths including said line of sight propagation path, and

wherein, in an obstructed state when said line of sight propagation path is obstructed, said receiver receives the millimeter band signal through each of the plurality of propagation paths except said line of sight propagation path.

19. The millimeter band signal transmitting/receiving system of claim 18, wherein at least a portion of said plurality of propagation paths are formed by at least one reflector.

20. The millimeter band signal transmitting/receiving system of claim 19, wherein said at least one reflector has a surface arranged substantially parallel to said line of sight propagation path.

21. The millimeter band signal transmitting/receiving system of claim 19, wherein said at least one reflector includes two reflectors.

22. The millimeter band signal transmitting/receiving system of claim 21, wherein at least one of said plurality of propagation paths of said signal is formed by reflection from each of said two reflectors.

23. The millimeter band signal transmitting/receiving system of claim 18, wherein said at least one transmitter is a single transmitter.

24. The millimeter band signal transmitting/receiving system of claim 18, wherein said at least one transmitter includes two transmitters and two associated transmit antennas, wherein each of said two associated transmit antennas provides a separate line of sight propagation path to said receive antenna.

25. The millimeter band signal transmitting/receiving system of claim 24, wherein said two transmitters are synchronized with each other.

26. The millimeter band signal transmitting/receiving system of claim 25, wherein said two transmitters share a common local oscillator.

27. The millimeter band signal transmitting/receiving system of claim 18, wherein said signal is a video signal.

28. The millimeter band signal transmitting/receiving system of claim 18, wherein said line of sight propagation path between said associated transmit antenna and the receive antenna is formed in a side lobe of said associated transmit antenna.

29. The millimeter band signal transmitting/receiving system of claim 18, wherein said plurality of propagation paths of said signal except said line of sight propagation path are formed in a main lobe of said associated transmit antenna.

30. The millimeter band signal transmitting/receiving system of claim 18, wherein a portion of said plurality of propagation paths are formed by interaction with a structural component of a building.

31. The millimeter band signal transmitting/receiving system of claim 18, wherein said receive antenna is a single receive antenna.

32. The millimeter band signal transmitting/receiving system of claim 18, wherein said receiver simultaneously receives the signal through each of an unobstructed plurality of propagation paths.

33. The millimeter band signal transmitting/receiving system of claim 1, wherein said receiver receives said signal wave through said line of sight propagation path when said line of sight propagation path is not blocked.

34. The millimeter band signal transmitting/receiving system of claim 1, wherein said receiver receives said signal wave only through said at least one indirect path when said line of sight propagation path is blocked.

35. The millimeter band signal transmitting/receiving system of claim 11, wherein said receiver receives one of said plurality of signal waves through at least one line of sight propagation path between at least one of said plurality of transmitters and said receiver.

36. The house provided with a millimeter band signal transmitting/receiving system of claim 15, wherein said receiver receives one of said plurality of signal waves through said line of sight propagation path when said line of sight propagation path is not blocked.

37. The millimeter band signal transmitting/receiving system of claim 15, wherein said receiver only receives said plurality of signal waves through said at least one indirect propagation path when said line of sight propagation path is blocked.

38. The millimeter band signal transmitting/receiving system of claim 1, wherein said at least one indirect propagation path is formed in a main lobe of a transmit antenna.

39. The millimeter band signal transmitting/receiving system of claim 1, wherein said line of sight propagation path is formed in a side lobe of a transmit antenna.

40. The millimeter band signal transmitting/receiving system of claim 15, wherein said line of sight propagation path is formed in a side lobe of a transmit antenna.

41. The millimeter band signal transmitting/receiving system according to claim 1, wherein the intensity of the signal wave received from the indirect propagation path is substantially the same as the intensity of the signal wave received from the line of sight propagation path.

42. The millimeter band signal transmitting/receiving system according to claim 41, wherein the intensity of the signal wave received from the indirect propagation path is at least 3dB greater than the intensity of the signal wave received from the line of sight propagation path.

43. The millimeter band signal transmitting/receiving system according to claim 1, wherein said stationary receiver receives a millimeter band signal wave having a carrier to noise ratio of at least 8dB when said line of sight propagation path signal wave is interrupted.

44. The millimeter band signal transmitting/receiving system according to claim 15, wherein the intensity of the signal wave received from the at least one indirect propagation path is substantially the same as the intensity of the signal wave received from the line of sight propagation path.

45. The millimeter band signal transmitting/receiving system according to claim 44, wherein the intensity of the signal wave received from the at least one indirect propagation path is at least 3dB greater than the intensity of the signal wave received from the line of sight propagation path.

46. The millimeter band signal transmitting/receiving system according to claim 15, wherein said stationary receiver receives a millimeter band signal wave having a carrier to noise ratio of at least 8dB when said line of sight propagation path signal wave is interrupted.

47. The millimeter band signal transmitting/receiving system according to claim 1, wherein, when the millimeter band signal wave is received from the plurality of propagation paths, the line of sight propagation path and the at least one propagation path are received

substantially without adverse effects caused by multiple paths.

48. The millimeter band signal transmitting/receiving system according to claim 15, wherein, when the millimeter band signal wave is received from the plurality of propagation paths, the line of sight propagation path and the at least one propagation path are received substantially without adverse effects caused by multiple paths.

APPENDIX B

There is no additional evidence pursuant to §§ 1.130, 1.131, or 1.132 and/or evidence entered by or relied upon by the examiner that is relevant to this appeal.

APPENDIX C

There are no related proceedings.